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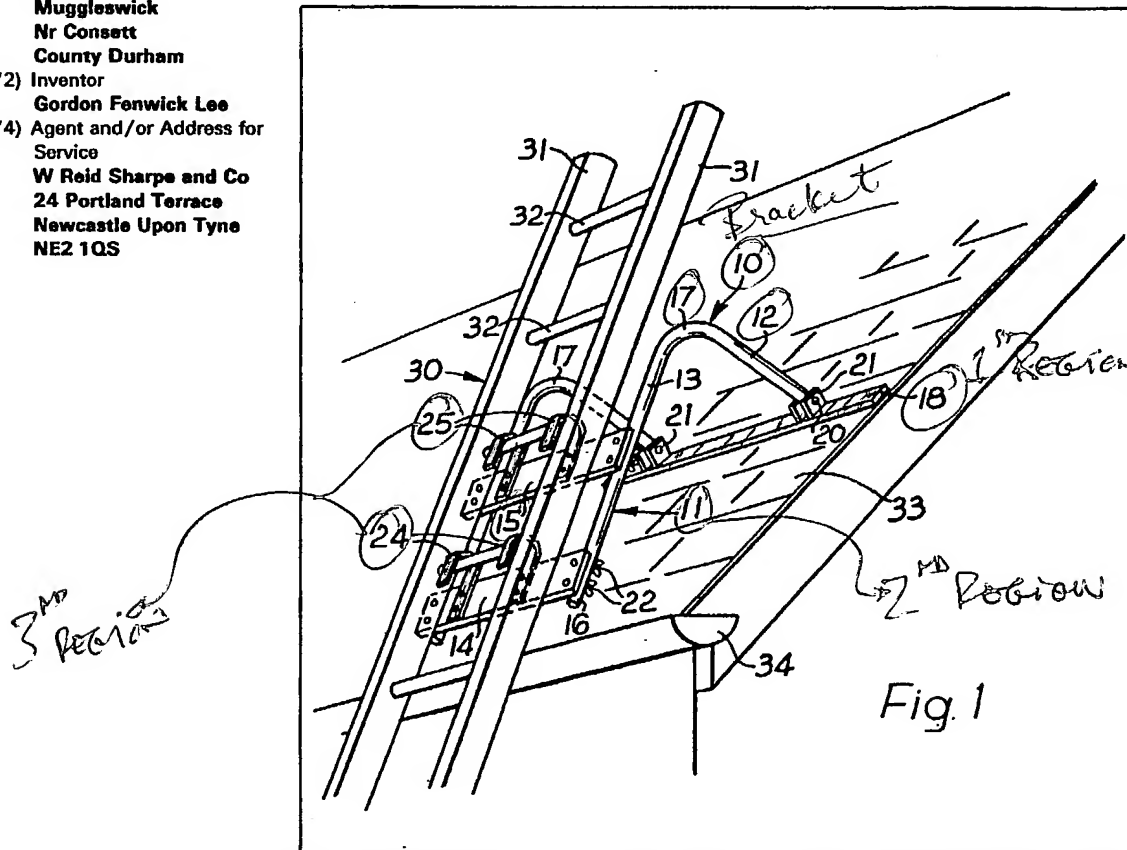
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**<sup>(12)</sup>UK Patent Application <sup>(19)</sup>GB <sup>(11)</sup>2 118 236 A**

- (21) Application No **8308845**  
(22) Date of filing  
**30 Mar 1983**  
(30) Priority data  
(31) **8209986**  
**8224448**  
(32) **5 Apr 1982**  
**25 Aug 1982**  
(33) **United Kingdom (GB)**  
(43) Application published  
**26 Oct 1983**  
(51) **INT CL<sup>3</sup> E06C 7/48**  
(52) Domestic classification  
**E1S LW1**  
(56) Documents cited  
**US 4194592**  
**US 4179011**  
**US 3780828**  
**GB A 2012341**  
**GB 0629851**  
**US 4369860**  
**US 4339020**  
**US 4331217**  
(58) Field of search  
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**(54) Ladder attachment**

(57) In order to prevent sideways slippage or swinging of a ladder 30, to prevent damage at contact points and to allow access to areas behind the ladder 30, an attachment 10 essentially comprises a pair of parallel curved or angled supporting arms 11 and a transverse pressure plate 18 which is swivellably attached to respective ends of said arms 11 and projects laterally therebeyond. In some embodiments additional transverse bracing members 14, 15 may connect the arms 11 and carry fastening means, such as hooks 24, 25, for securement of the attachment 10 to the ladder 30. With other embodiments the ends 16 of the arms 11 may simply be able to fit into hollow upper ends of ladder stiles, or, alternatively, over upper ends of ladder stiles.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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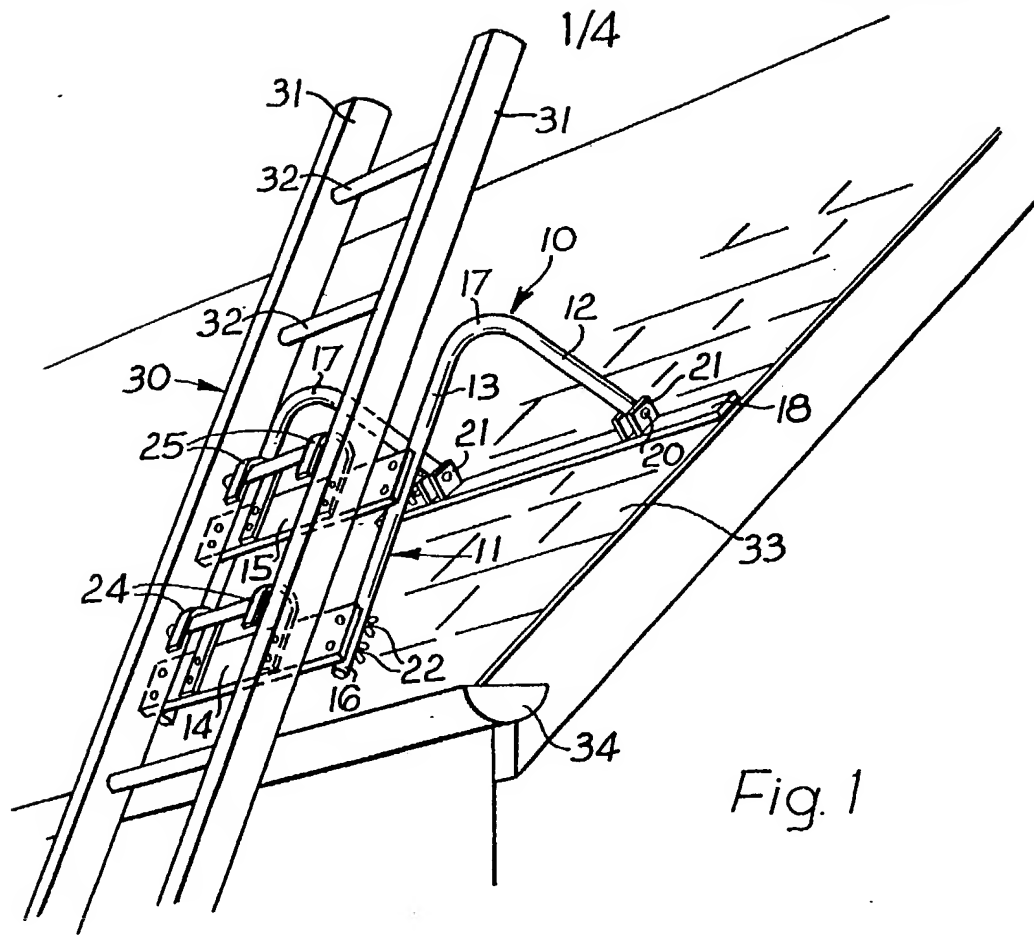


Fig. 1

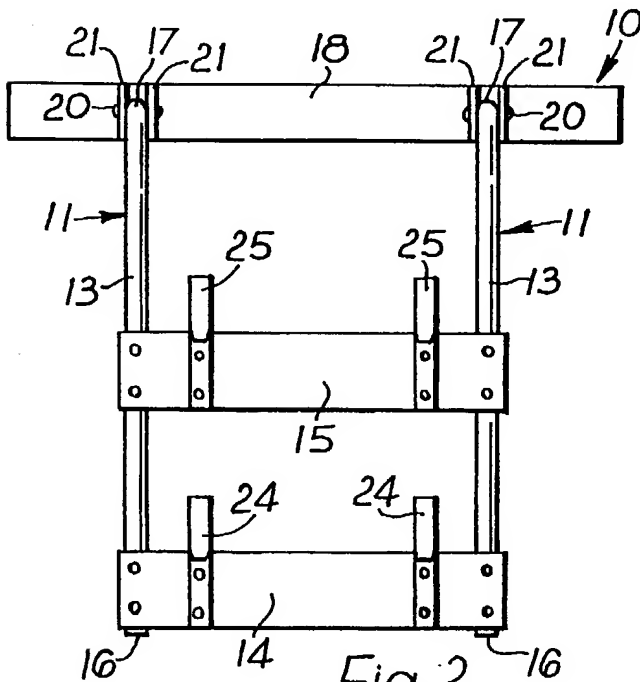


Fig. 2

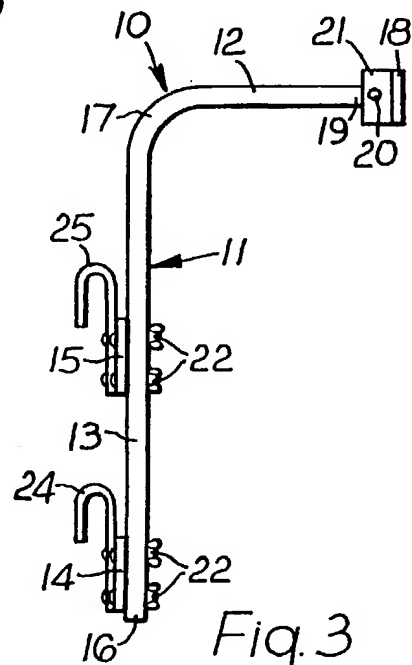


Fig. 3

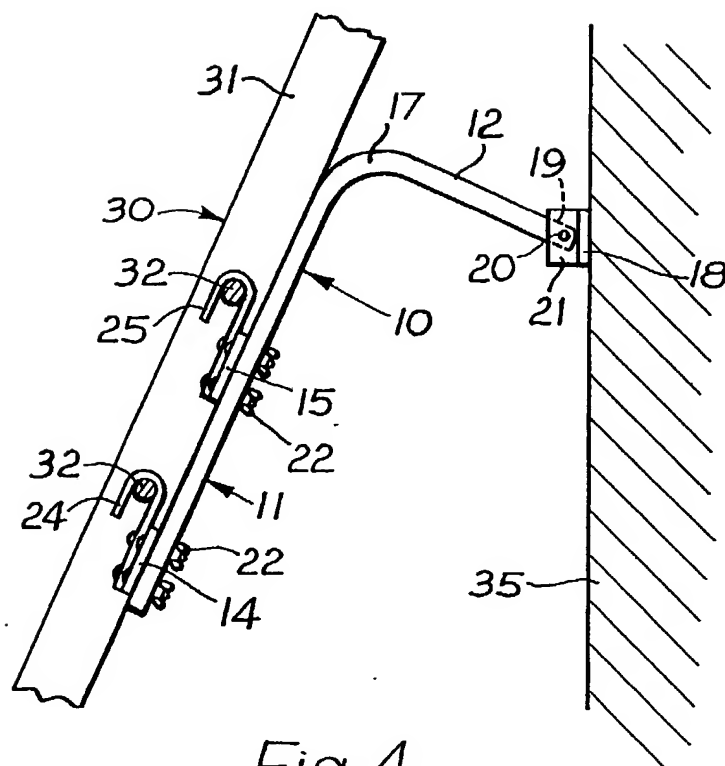


Fig. 4

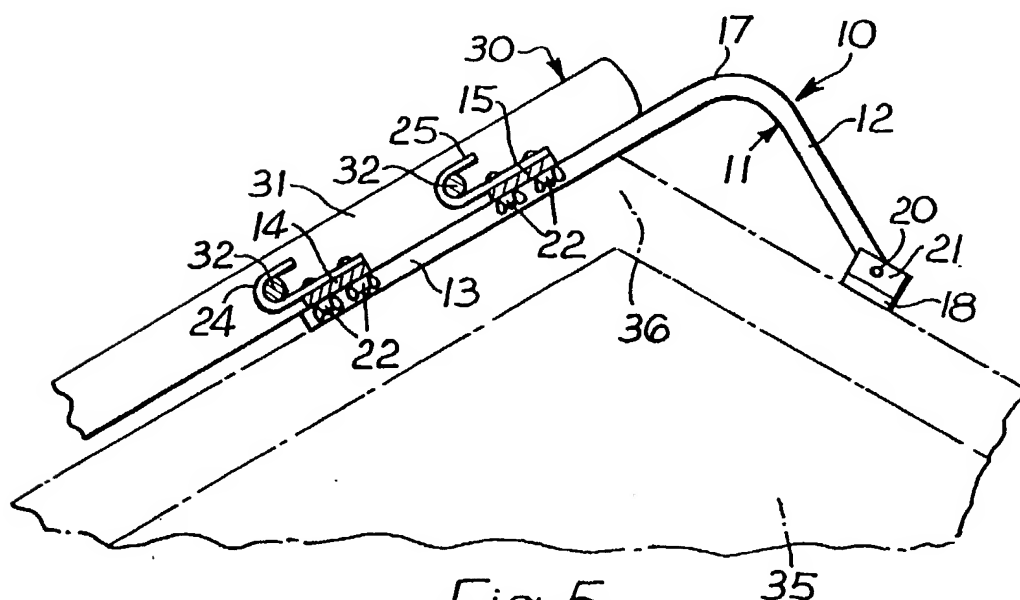
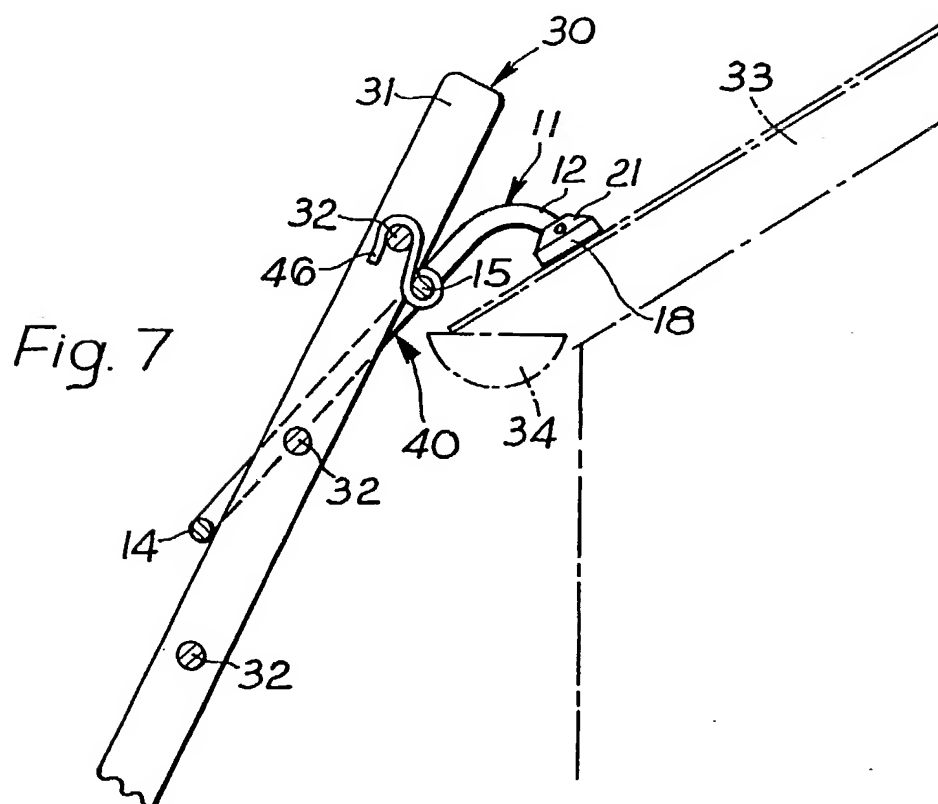
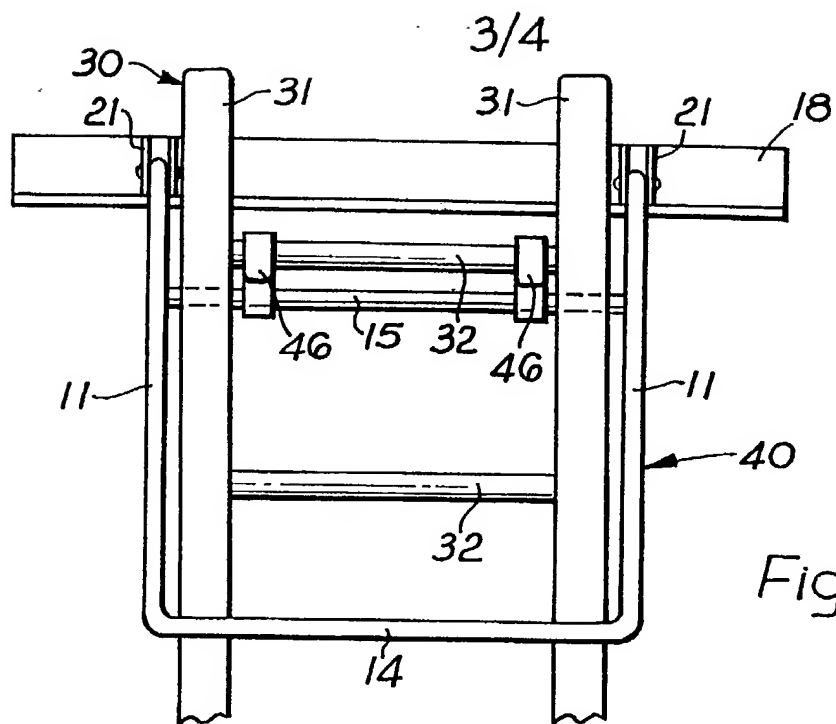


Fig. 5



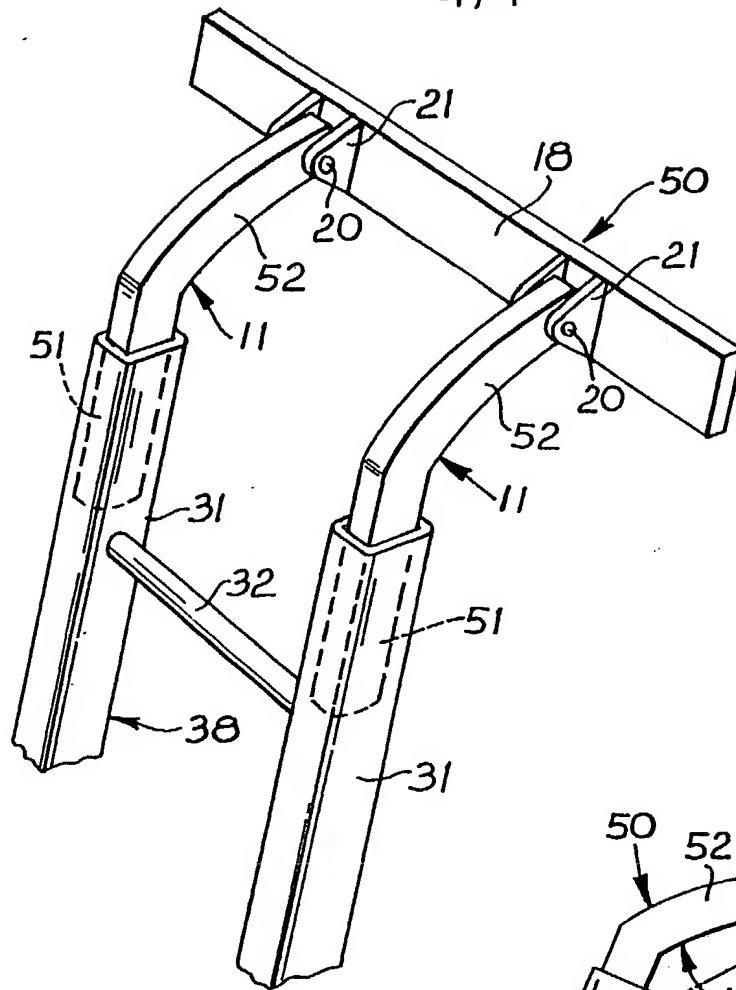


Fig. 8

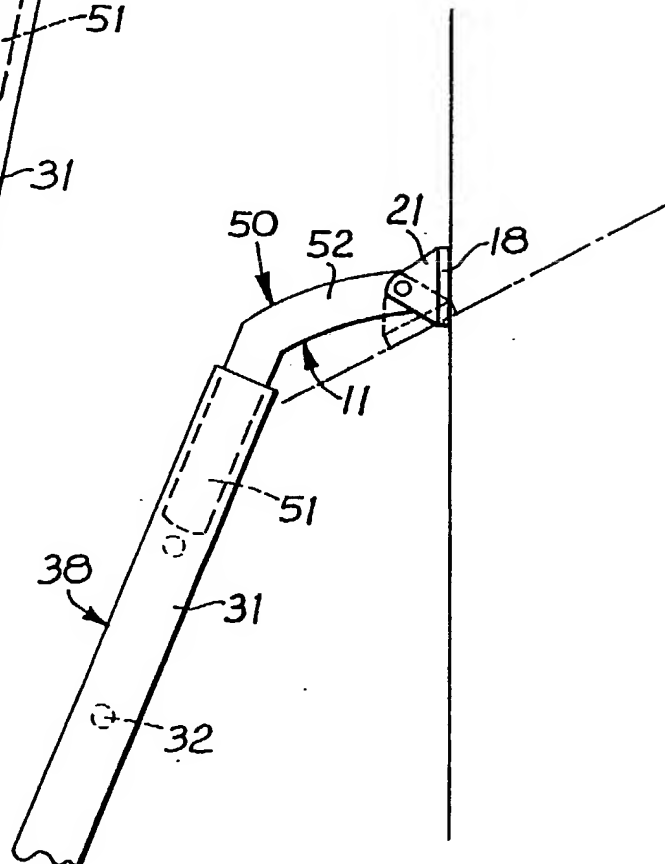


Fig. 9

## SPECIFICATION

### Ladder attachment

5 This invention concerns a ladder attachment.

In spite of the long history of the ladder and numerous attempts at its improvement, many problems relating to use of the ordinary ladder, which comprises a pair of substantially parallel stiles connected together by a number of rungs, still exist. The main problem is instability of the ladder, particularly as regards slipping of the upper part of the ladder where it contacts a supporting surface and turning of the ladder about one of the stiles when an unbalanced load causes torque. Indeed, a number of fatalities due to accidents caused by ladder slippage occur each year. Another problem is the likelihood of damage to walls, gutters, eaves and other structures due to the small contact area of the stiles of the ladder. Also, a further drawback associated with use of the ordinary ladder is the fact that it is not possible to work on areas, such as upstairs windows, which are beneath, behind or in contact with the upper region of the ladder.

An object of the present invention is to provide a simple, inexpensive and easy to use ladder attachment which, when used in conjunction with an ordinary ladder, will obviate the above-mentioned problems.

It would also be advantageous if an ordinary ladder could, in a simple, safe and effective manner, be adapted for use as a cat-roof ladder. A further object of the invention is to provide a ladder attachment whereby this can be achieved.

With these objects in view, the present invention provides a ladder attachment comprising a pair of parallel curved or angled supporting arms which are braced apart, and a pressure plate extending transversely of said arms and projecting laterally therebeyond, which plate is swivellably attached at one end of each arm.

Preferably, at least one additional transverse member is provided to brace apart the supporting arms. In such instance, fastening means enabling securement of the attachment to a ladder is preferably provided on at least one of the additional transverse members. Such fastening means advantageously comprises a number of hooks, e.g. two per transverse member, which may be releasably secured, e.g. by wing nuts, to the respective transverse members.

In alternative embodiments, however, no such additional transverse member(s) or fastening means need be provided, the supporting arms being secured to the ladder and braced apart by fitting into hollow ladder stiles, or by themselves being formed hollow and fitting over the respective ladder stiles.

The invention will be described further, by way of example, with reference to the accom-

panying drawings, in which:

*Figure 1* is a fragmentary perspective view illustrating a preferred embodiment of the ladder attachment of the invention secured to an upper section of a ladder and in use supporting same against a roof;

*Figure 2* is a front view of the ladder attachment shown in Fig. 1;

*Figure 3* is a side elevation of the ladder attachment shown in Figs. 1 and 2;

*Figure 4* is a fragmentary cross-section illustrating the same embodiment of the ladder attachment of the invention secured to an upper section of ladder and in use supporting same against a vertical wall;

*Figure 5* is a fragmentary cross-section illustrating the same preferred embodiment of the ladder attachment of the invention secured to the upper region of a ladder in such a manner that, in combination, an effective cat-roof ladder is provided, the same being shown in use;

*Figure 6* is a fragmentary front view illustrating a second embodiment of the ladder attachment of the invention secured to the upper region of a ladder;

*Figure 7* is a fragmentary cross-section illustrating the second embodiment of the attachment secured to the upper region of a ladder and in use supporting same against a roof;

*Figure 8* is a fragmentary perspective view illustrating a third embodiment of the ladder attachment of the invention secured to the upper region of a ladder; and

*Figure 9* is a side elevation illustrating the third embodiment of the attachment secured to the upper region of a ladder and in use supporting same against a vertical surface or an inclined surface.

As illustrated in Figs. 1 to 5, a preferred embodiment of the ladder attachment of the invention, designated as a whole by reference numeral 10, comprises two supporting arms 11 in the form of aluminium tubes of equal length which are each bent round (at 17) at an angle of 90° about one third of the way along their length to provide respective short limbs 12 and long limbs 13. These arms 11 are braced apart, parallel to each other, by two transverse members in the form of aluminium bars 14, 15 which are rivetted or bolted at their respective ends to the long limbs 13 of the arms 11, one bar 14 extending between the limbs 13 adjacent their free ends 16 and the other bar 15 extending therebetween about halfway between the free ends 16 and the bends 17 in the respective arms 11.

A pressure plate 18, also in the form of an aluminium bar, extends transversely of the arms 11 between the free ends 19 of their respective short limbs 12 and also projects laterally beyond said arms 11. The pressure plate 18 is swivellably or pivotally connected to each free end 19 by a pivot shaft 20 extending between a pair of upstanding

flanges 21 of the plate 18 and through a hole in the arm 11 adjacent the respective free end 19.

A pair of aluminium hooks 24, 25 are secured symmetrically to each of the transverse members 14, 15, attachment of said hooks 24, 25 being by way of bolts and wing nuts 22 so as to facilitate their easy release.

As described, the constituent parts of the attachment 10 are preferably made of aluminium so that when assembled the attachment is light and easy to manipulate.

In use the hooks 24, 25 may be attached to the bars 14, 15 so that they project away from the bends 17 (i.e. in the direction of the free ends 16 of the long limbs 13). The entire attachment 10 can then be fitted onto a conventional ladder 30, comprising a pair of elongate parallel stiles 31 connected by a number of equi-distant rungs 32, by hooking said hooks 24, 25 over adjacent rungs 32 near that end of the ladder 30 intended to be the upper end when the ladder 30 is in position. The ladder 30 is raised into the desired position and as shown in Figs. 1 and 4 respectively, by virtue of the swivellable pressure plate 18, the attachment can effectively support the upper end of the ladder 30 against an inclined surface, such as a roof 33, or a vertical surface, such as a wall 35.

As the pressure plate 18 projects laterally beyond the supporting arms 11, for example by about 30 cm in each case, there is no possibility of the ladder 30 slipping sideways or swinging about one stile 31 due to an uneven load. Moreover, as the contact area of the attachment 10 is the entire area of one side of the pressure plate 18, which area is relatively large, the pressure per sq cm is correspondingly low and there is unlikely to be any damage to the roof 33 or the wall 35.

In particular, in the scene depicted in Fig. 1, it should be noted that the attachment 10 holds the ladder 30 clear of a gutter 34 adjacent the eaves of the roof 33 so that there is no possibility of the gutter 34, which is usually formed of plastics or of aluminium, breaking or being otherwise damaged, as would certainly be the case if the ladder 30 were to rest directly against said gutter 34. As the ladder 30 is, as mentioned, held away from the roof 33 or wall 35, there is easy access to underlying areas, e.g. the gutter 34 itself, or an upstairs window (not shown) immediately beneath the gutter 34 or provided in the wall 35, so that repair, cleaning, pointing etc., of such areas is facilitated.

When a cat-roof ladder is required, it is an easy matter to unscrew the wing nuts 22, reverse the positions of the hooks 24, 25 and resecure them, and position the attachment 10 over the roof apex 36, as shown in Fig. 5, the pressure plate 18 again swivelling to take up an appropriate orientation flush with the

far side of the roof 33. The ladder 30 can then be raised sufficiently until two adjacent upper rungs 32 engage in the hooks 24, 25.

Alternatively, in the case of a modified embodiment of the attachment or in the case of a ladder with appropriate rung spacing, for either the first mentioned uses, or to provide a cat-roof ladder, only one pair of hooks 24 need be reversed so that the attachment 10 is firmly clamped onto the ladder with the hooks 24, 25 engaging around adjacent or next but one rungs.

Figs. 6 and 7 illustrate a second embodiment 40 of the ladder attachment of the invention which is very similar in principle to the above-described embodiment. For clarity, the same reference numerals have been used for corresponding parts. In this embodiment 40 the two supporting arms 11 and the lower transverse member 14 are formed integrally as a U-shaped aluminium tube and the other transverse member 15 is a welded-on aluminium tube. The short limbs 12 of the arms 11 are shorter than in the first embodiment, so this attachment 40 is not suitable for providing a cat-roof ladder. In use, a ladder 30 is intended to project through the rectangular opening bounded by the two arms 11 and the two transverse members 14, 15 and two hooks 46 which are attached so as to be freely rotatable on the transverse member 15 engage one of the rungs 32 of the ladder 30 adjacent the end thereof which will be uppermost when the ladder 30 is in position.

A third embodiment 50 of the ladder attachment of the invention is illustrated in Figs. 8 and 9. Again, for the sake of clarity, the same reference numerals will be used for parts corresponding to parts of the first embodiment (Figs. 1 to 5). This embodiment 50 simply comprises two parallel supporting arms 11 each pivotally attached at its extremity to a transverse pressure plate 18 which extends laterally beyond each of the arms 11. There are no additional transverse members and no fastening means such as hooks. The arms 11 are substantially rectangular in cross-section and may be solid or hollow. They also have corresponding straight portions 51 adjacent their free ends 16 and curved portions 52 adjacent their pivotal connections with the pressure plate 18.

In use, the straight portions 51 of the arms 11 of the attachment 50 are inserted into the hollow ends of stiles 37 of a ladder 38 at that end of the ladder which is intended to be uppermost. The attachment 50 thereafter functions as described above although, again it is not suitable for provision of a cat-roof ladder.

In a modification of the aforesaid embodiment, the straight portions 51 of the arms 11 of the attachment are hollow and have a sufficiently large internal cross-section to accommodate the upper ends of the stiles of a



ladder.

- The invention is not, of course, limited to the details of the abovementioned embodiments and many variations are possible within the scope of the claimed invention. In particular, the material of the attachment may be plastics, metal or wood, although aluminium is preferred because of its lightness which makes the attachment easy to handle. Also, the exact form of the supporting arms and the transverse members may be different from those described and the supporting arms may be fairly sharply angled, rather than gently curved. Moreover, the fastening means need not be hooks but could be other clamping means, clips or bolts, and these may be adjustable for attachment to holders having differing rung intervals.

## 20 CLAIMS

1. A ladder attachment comprising a pair of parallel curved or angled supporting arms which are braced apart, and a pressure plate extending transversely of said arms and projecting laterally therebeyond, which plate is swivellably attached at one end of each arm.
2. A ladder attachment as claimed in claim 1 wherein at least one additional transverse member is provided to brace apart the supporting arms.
3. A ladder attachment as claimed in claim 2 wherein fastening means enabling securement of the attachment to a ladder is provided on at least one of the additional transverse members.
4. A ladder attachment as claimed in claim 3 wherein the fastening means comprises a number of hooks.
5. A ladder attachment as claimed in claim 4 wherein each of the hooks is releasably secured to one of the transverse members.
6. A ladder attachment substantially as hereinbefore described with reference to and as illustrated in Figs. 1 to 5, or in Figs. 6 and 7 or in Figs. 8 and 9 of the accompanying drawings.